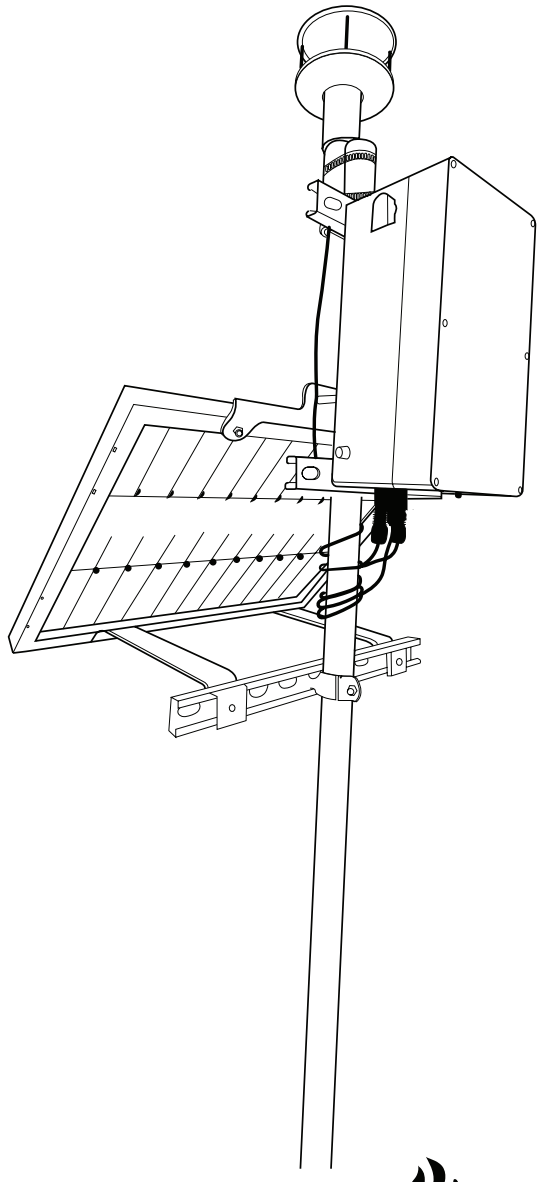
SCIENTIFIC AVIATION



SOOFIE

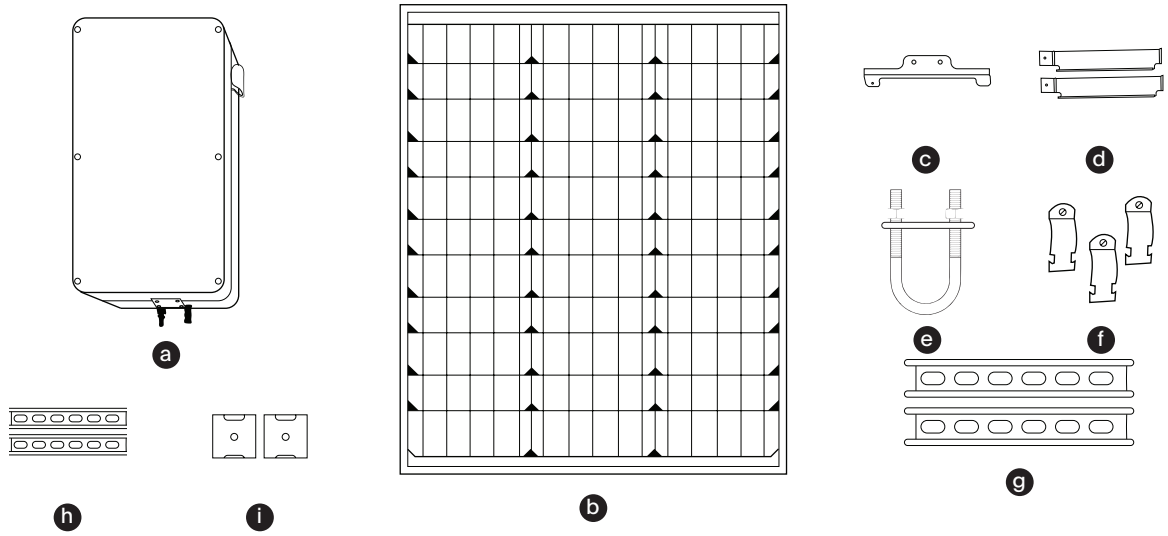
Systematic Observation Of Facility Intermittent Emissions

INSTALLATION GUIDE

CONTENTS

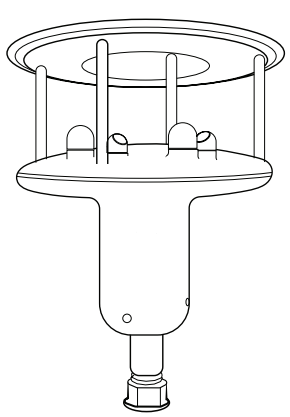
In the app, click and then to begin monitoring.

SOOFIE Parts List



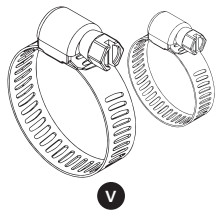
Label	Qty	Description
A	x1	SOOFIE Enclosure
B	x1	Solar Panel
C	x1	Solar Panel Upper Bracket
D	x2	Solar Panel Lower Brackets
E	x1	U-bolt With Mount Plate And Nuts
F	x3	Unistrut Clamps
G	x1	14″ Unistrut Channel
H	x2	7.8″ Unistrut Channels
I	x6	Square Unistrut Washers
J		Bag
	x4	10-32 × 2″ Pan Head Phillips Machine Screws
	x4	¼″-20 × ⅝″ Hex Head Bolts
	x2	¼″-20 × 1-¾″ Hex Head Bolts
	x4	#10 Screw Size Flat Washers
	x4	#10 Screw Size Split Ring Lock Washers
	x6	¼″ Screw Size Split Ring Lock Washers
	x2	⅜″ Screw Size Split Ring Lock Washers
	x6	¼″-20 Hex Nuts
	x2	Splashproof Fuse Receptacle Caps
	x2	10 Amp Medium-Blow Cartridge Fuses

Anemometer Parts List



s

t



v

u

w

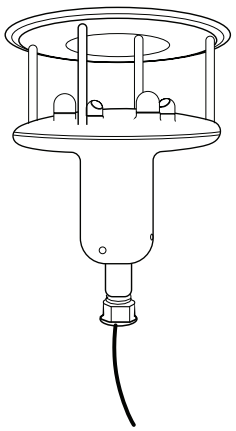
Label	Qty	Description
S	x1	Sonic Anemometer
T	x1	Cable
U	x1	Mounting Stub
V	x2	Hose Clamps
W	x3	10-32 × 3/8″ Pan Head Phillips Machine Screws

Installation Tools (Supplied By The User)

	Needed for installation
1.	Phillips screwdriver, 2-point tip
2.	Slotted screwdriver, 1/4” tip
3.	3/8” drive ratchet handle
4.	5/16” socket
5.	7/16” socket
6.	1/2” socket
7.	9/16” deep socket
8.	7/16” open-ended wrench
9.	1/2” open-ended wrench
10.	6” diagonal cutting pliers
11.	8” slip-joint pliers
12.	Small tape measure
13.	Marker pen
14.	Stepladder

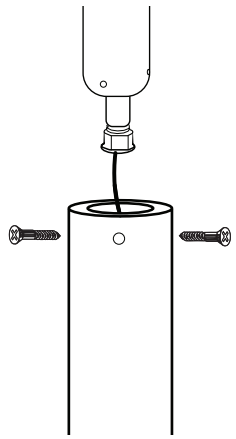
Installation Procedure

1a. (If Applicable) Attach The Anemometer To The Stub.

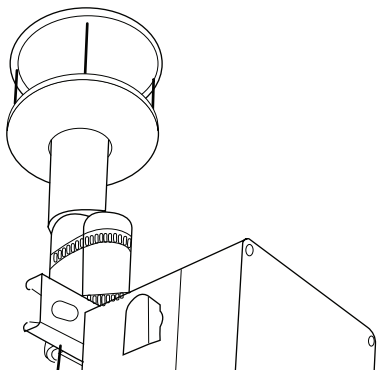


Step 1: Attach the **cable** to the **anemometer**. Rotate the plug to align with the keyed receptacle; twist the sleeve several turns clockwise to lock the plug (feel for a ‘click’ to ensure the lock mechanism is engaged).

Step 2: Pass the **cable** through the **mounting stub** and attach the **stub** to the anemometer using three 10-32 × 3/8″ pan head Phillips machine screws. Tighten to 20 in-lbs.

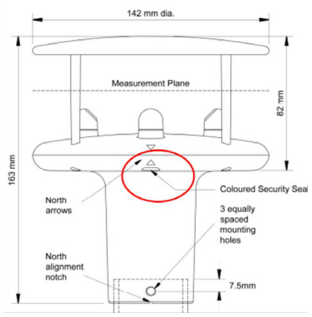


1b. (If Applicable) Attach The Anemometer To The Pole.

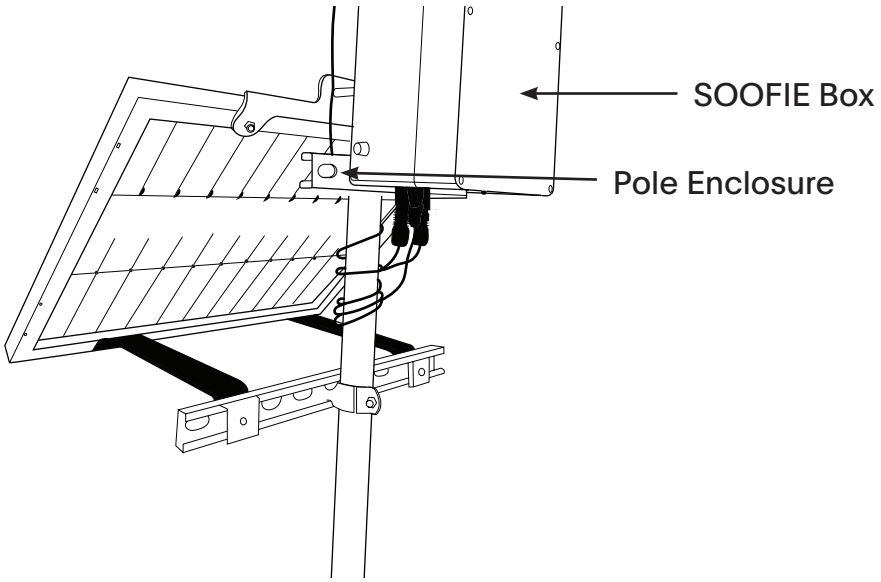


Step 1: Position the **anemometer & stub assembly** at the top of the pole on the South side. Install two **hose clamps** around the stub and the pole and spaced 3″ apart

Step 2: ⚠ Orient the **assembly** so the measurement plane is horizontal and the North arrows and colored security seal (circled below) point to true North after the **hose clamps** are securely tightened.



2. Attach The Solar Panel To Its Mounting Frame.



Step 1: Measure & mark the pole at **6.0**", **13.5**", and **29.5**" from the top.

Step 2: Position the solar panel **upper mounting bracket** with the bend facing the **solar panel** and attach with two ¼-20 × 5/8" hex head bolts, lock washers, and nuts. Tighten nuts to 75 in-lbs.

Step 3: Attach two solar panel **lower mounting brackets** to the other edge of the **solar panel** with two ¼-20 × 5/8" hex head bolts, lock washers, and nuts. Tighten nuts to 75 in-lbs.

Step 4: Attach the other ends of the **lower mounting brackets** to the **14" long Unistrut channel** with two ¼ -20 × 1.75" hex head bolts, square Unistrut washers, lock washers, and nuts. Tighten nuts to 75 in-lbs. Support the Unistrut channel and lower mounting brackets to avoid bending the solar panel frame.

Step 5: Place the solar panel and frame **assembly** at the base of the pole and facing South.

Step 6: Position the **U-bolt** around the pole, through the solar panel **upper mounting bracket**, and through the rectangular **U-bolt mounting bracket**. Install two 3/8" lock washers and nuts, and leave loose.

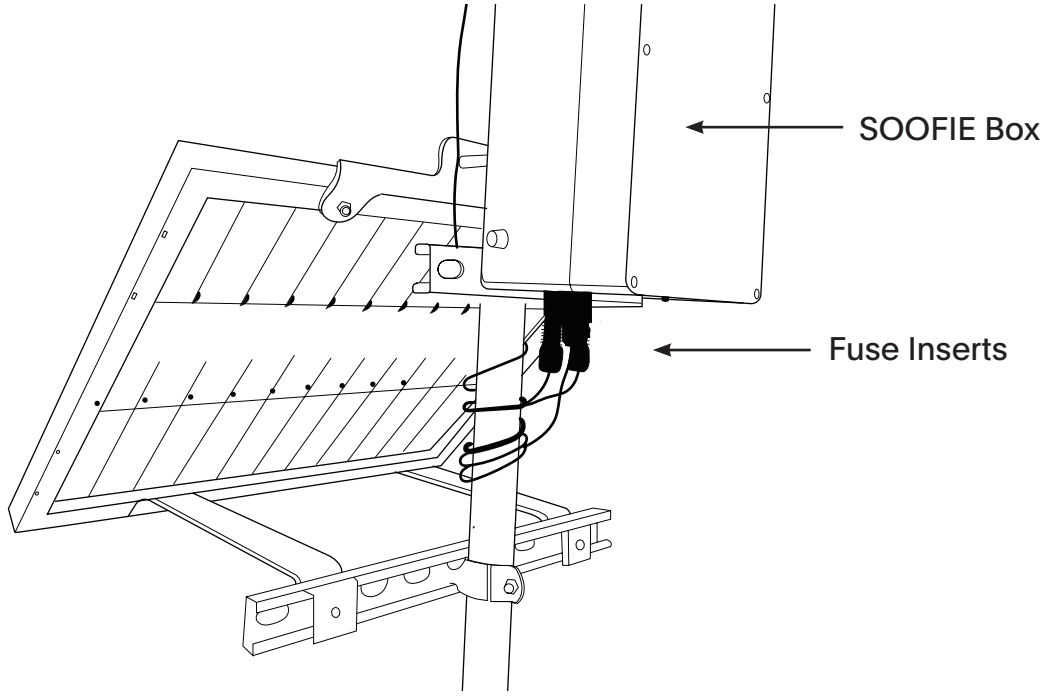
Step 7: Attach a **Unistrut clamp** to the **Unistrut channel** at the base of the pole, install the pole clamp bolt and nut, and leave loose.

Step 8: Slide the solar panel **assembly** up the **pole** to position the **U-bolt** at the 13.5" mark and the top of the Unistrut clamp at the 29.5" mark below the top of the pole. Support the Unistrut channel to avoid bending the solar panel frame.

Step 9: Ensure the panel is facing South; tighten the Unistrut clamp (75 in-lbs) and the U-bolt nuts (120 in-lbs) to secure the solar panel to the pole.

3. Attach the SOOFIE enclosure to the pole.

FUSE WARNING ⚠
May fall out if not properly installed not causing worker to have to return to site for reinstallation



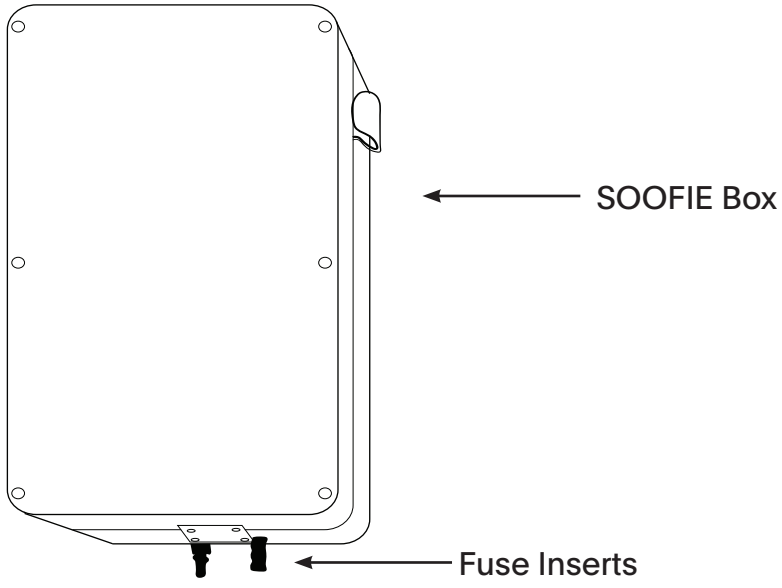
Step 1: Attach two 7.8”-long Unistrut channels to back of the SOOFIE enclosure with four 10-32 × 2” pan head Phillips screws, #10 lock washers, #10 flat washers, and square Unistrut washers. Torque to 16 in-lbs (1.8 Nm).

Step 2: Position the top of a Unistrut clamp at the 6.0” mark below the top of the pole and engage the upper Unistrut channel on the SOOFIE enclosure. Slide the enclosure to the side closest to the solar panel junction box.

Step 3: Position another Unistrut clamp around the pole and engage the lower Unistrut channel on the SOOFIE enclosure.

Step 4: Tighten both Unistrut clamps securely (75 in-lbs).

4. Power Up The System And Connect The Cables.



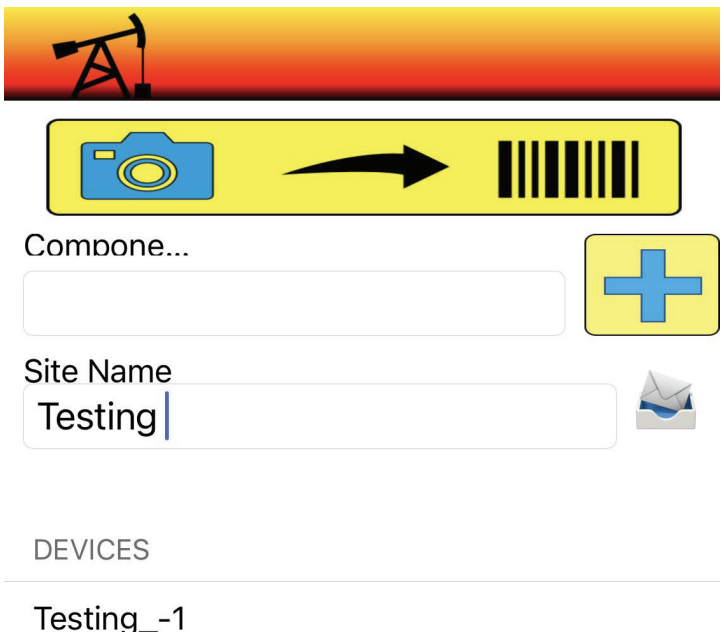
Step 1: Insert a 10A medium-blow fuse into a fuse receptacle cap; push in FIRMLY and turn clockwise to install in the left-hand fuse receptacle. Confirm fuse cap is locked and confirm audible fan operation. This fuse completes the battery circuit; SOOFIE is now operating!

Step 2: Insert the (+) and (−) connectors from the solar panel into the MC4 receptacles on the SOOFIE enclosure. Confirm both connectors are fully inserted and locked.

Step 3: Insert a 10A medium-blow fuse into a fuse receptacle cap; push in FIRMLY and turn clockwise to install in the right-hand fuse receptacle. Confirm fuse cap is engaged and locked. This fuse completes the solar panel charging circuit.

Step 4: (if applicable) Insert the anemometer cable connector into the M8 receptacle on the SOOFIE enclosure and rotate the knurled barrel on the cable connector until finger-tight.

5a. Enter and upload site data using the SOOFIE iOS app



Step 1: Go to the App Store and download the SOOFIE app to your iOS device.

Step 2: Confirm that the iOS default Mail app is installed and configured on your iOS device.

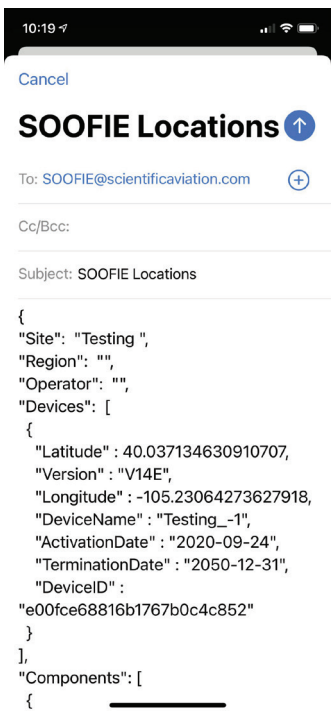
Step 3: Open the SOOFIE app and type in a name for this site.

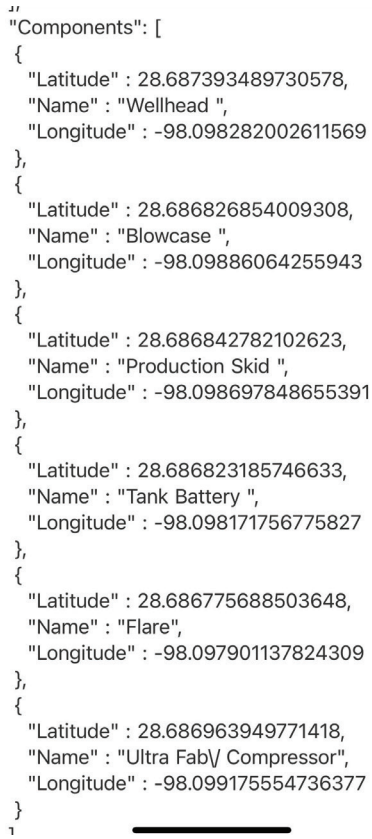
Step 4: Click the camera button. Please wait a few seconds while precise GPS coordinates are captured, and the camera view activates.

Step 5: Using the camera, scan the bar code located on the side of an installed SOOFIE sensor box. The box name and location data will appear in the field below “Devices”. **If you’ve made a mistake, just swipe left to delete an entry, and re-scan.**

Step 6: Repeat this scan process for each SOOFIE box at the site.

5b. Enter and upload site data using the SOOFIE iOS app





Step 1: Next, you'll need to geotag each component on the site so that SOOFIE can automatically identify source locations.

Step 2: Walk up to each facility component (tank, wellhead, compressor, flare, etc.), type in a unique name in the COMPONENT field, and click the + button to add it to the database. Repeat this process for each component at the site. If you've made a mistake, just swipe left to delete an entry, and re-enter.

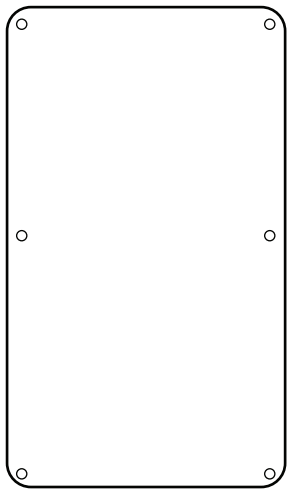
Step 3: When all site components and SOOFIE sensor boxes have been added, click the email button. A draft email to SOOFIE@scientificaviation.com will appear.

Step 4: After reviewing, click the send button to upload the site data and begin monitoring.

Step 5: Please confirm with SOOFIE team that your devices are up and running before leaving the site.

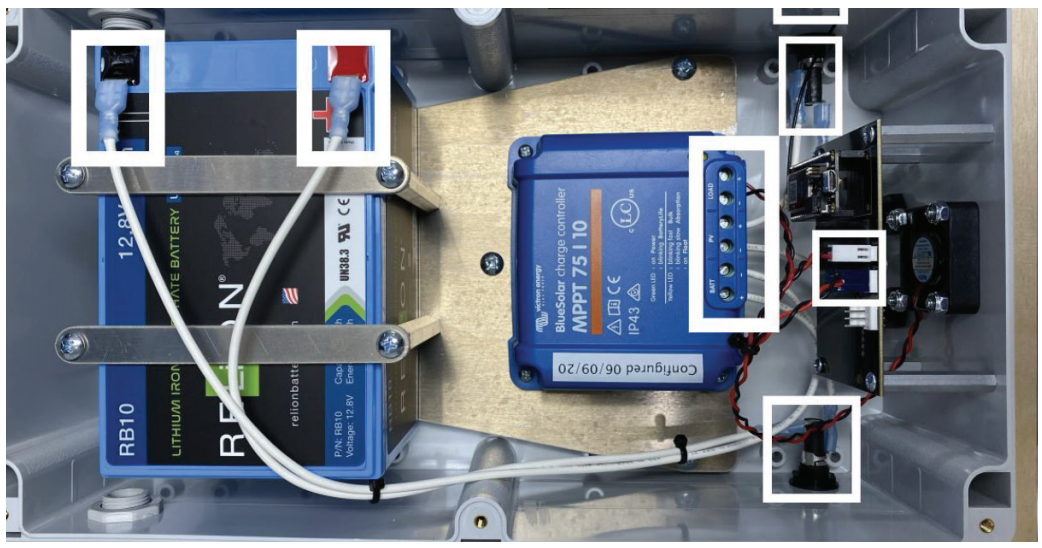
Troubleshooting

1. Open the SOOFIE enclosure.



Step 1: Loosen all 6 recessed cover screws and remove cover.
NOTE: Cover screws are not captive; do not flip the cover over.
CAUTION: High-current DC voltage up to 25v is exposed with cover off.

2. Check fusing and wiring.



NOTE: The two fuses are interchangeable, but their removal/reinsertion order is important. The solar panel fuse MUST be removed first AND reinserted last, following the sequence below.

Step 1: Remove the solar panel fuse from right-hand fuse holder by pushing in firmly and turning counter-clockwise ½ turn; ensure fuse is intact or replace with a new 10A 250V medium-blow 1/4" x 1-1/4" glass cartridge fuse.

Step 2: Remove the battery fuse from left-hand fuse holder by pushing in firmly and turning counter-clockwise ½ turn; ensure fuse is intact or replace with a new 10A 250V medium-blow 1/4" x 1-1/4" glass cartridge fuse.

Step 3: Reinsert the battery fuse into left-hand fuse holder

Step 4: Reinsert the solar panel fuse into right-hand fuse holder.

Step 5: Confirm that all cables are firmly captured in MPPT solar controller screw terminals.

Step 6: Confirm that crimp terminals are fully engaged on battery and fuse holder tabs.

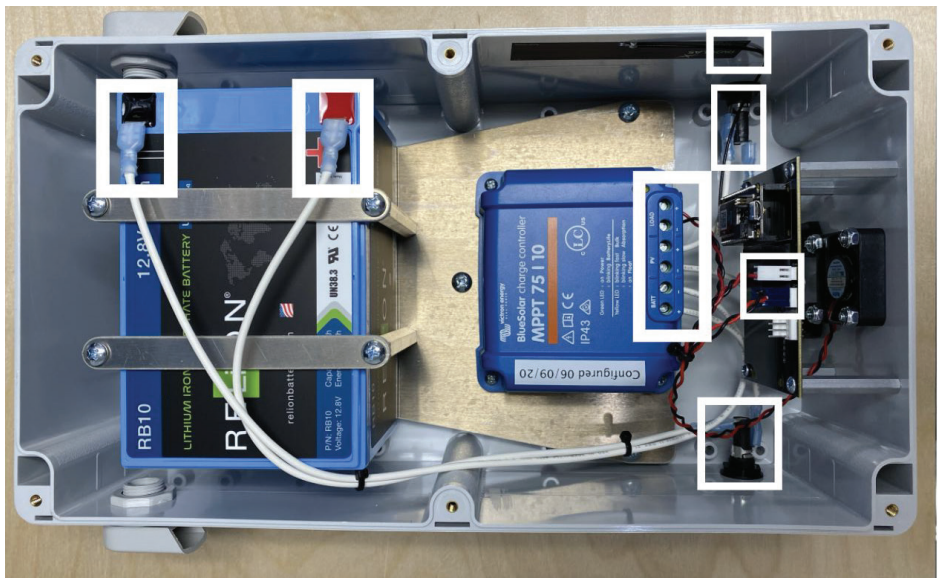
Step 7: Confirm that the MTA connectors on the sensor board are properly seated.

3. Check and record voltages.

With a voltmeter, check and record DC voltages between:

1	Terminals on $LiFePO_4$ battery:	vDC
2	BATT terminals on MPPT charge controller: PV terminals on MPPT charge controller:	vDC
3	**Note: PV terminal voltage will be zero unless the solar panel is connected and exposed to the sun**	vDC
4	LOAD terminals on MPPT charge controller:	vDC

4. Check operation



Step 1: Check that the intake fan is running.

Step 2: Check the two LEDs on the MPPT solar charge controller:
a. Green LED on or blinking? (power from battery)
b. Yellow LED on or blinking? (charging from panel)

Step 3: Check the status LED on the Particle Boron/Argon microprocessor:
a. pulsing cyan? (connected to Internet)
b. blinking green? (looking for cellular/wifi service)
c. magenta? (firmware update in progress)

Warning

- Make Sure There Are No Obstructions Within **20ft** Of Solar Panel This Will Render Device Ineffective And Cause Disruptions
- (North Arrow) Make Sure **Anemometer** Is Pointing True **North**

If these steps have identified an obvious problem with no immediate solution, please call Scientific Aviation at (303) 551-2005.